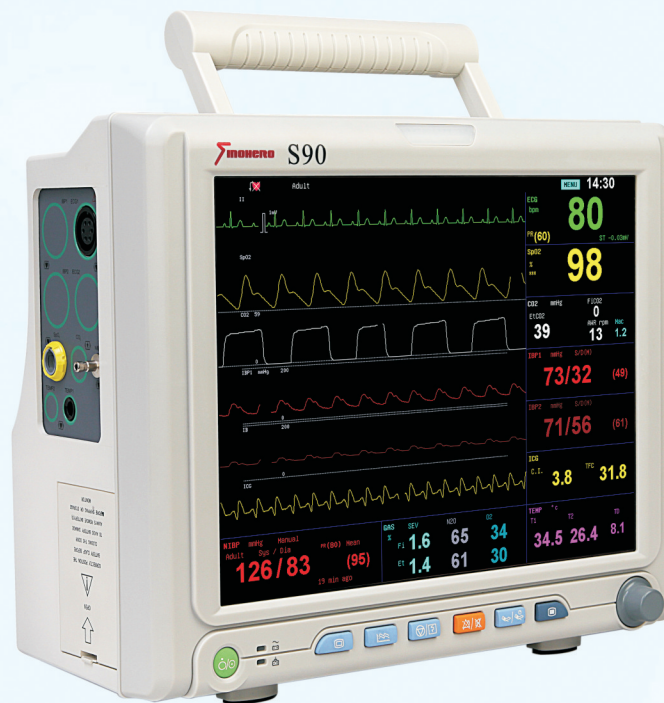


# S90

## Multi-parameter Patient Monitor



- 12.1 " color TFT display with maximum 10 waveforms
- Power software function include OxyCRG, Large Font, Short Trend, and Drug calculations
- Pitch tone to provide audibly recognized SpO2
- Maximum 168-hour trends to review all parameters' information
- Rechargeable battery for long time use
- Wire or wireless networking with Central Monitoring Systems

## S90 Main Unit

### Size and Weight

- Size: 318mm×264mm×152mm
- Weight: 4.5kg

### Power supply

- Power Voltage: AC 100-240V 50/60Hz
- Power Input:  $\approx$  85VA
- Safety class: Category I

### Display

- 12.1" Color TFT display
- Resolution: 800x600 pixels

### Battery

- Type: Rechargeable Acid Battery (Option Lithium battery)
- Operating time under the normal use and full charge:  $\approx$  120minutes
- 2 batteries  $\approx$  240 minutes (Option Lithium battery will double operate time)

### Thermal Recorder

- Method: Thermal dot array
- Paper width: 50mm (1.97 in)
- Paper Speed: 12.5/25/50 (mm/sec)
- Traces: Maximum 3 tracks

### Alarm

- Three Levels: Low, medium and high
- Indication: Auditory and visual
- Setup: Default and custom
- Silence: All alarm can be silenced
- Volume: 45-85 dB measured at 1 meter

### Trend

- Trend: 168 hours
- Parameters option: HR, SpO2, NIBP, PR, RESP, EtCO2, Temp1, Temp2, AA, N2O, O2, IBP1, IBP2, ST.
- Cycle intervals of trend storage: 1 min, 2 min, 3 min, 4 min, 5 min, 10 min, 15 min, 20 min, 25 min, 30 min.

### Storage & Reviewing

- ECG: 30 minutes one important lead's ECG waveform
- Alarm: 1800 groups alarm events reviewing
- NIBP: 1000 groups NIBP measurement
- Arrhythmia: 128 groups data (8 seconds ECG waveform)
- Power-off storage: 72 hours trend data & 1 ECG wave form (Option)

### ECG

- Lead Mode: 3-leads ECG input  
5-leads ECG input
- Lead selection: I, II, III, I, II, III, aVR, aVL, aVF, V-
- Gain: 2.5mm/mV( $\times 0.25$ ), 5mm/mV( $\times 0.5$ ), 10mm/mV( $\times 1$ ), 20mm/mV( $\times 2$ ), 40mm/mV( $\times 4$ ), Auto
- CMRR: Monitor mode  $\approx$  105dB  
Surgery mode  $\approx$  105dB  
Diagnostic mode  $\approx$  90dB
- Frequency response (-3dB):  
Monitor mode 0.5~40Hz  
Surgery mode 1~25Hz  
Diagnostic mode 0.05~150Hz
- input impedance:  $\approx$  5.0M $\Omega$
- ECG signal range:  $\approx$  10.0mV
- Electrode offset potential:  $\pm$ 50mV
- Patient Leakage Current: <10uA
- Standardizing signal: 1mV $\pm$ 5%
- Baseline recovery: <5s after Defibrillation. (Mon or Surg mode)
- Indication of electrode separation: Every electrode (exclusive of RL)
- Protection: Breakdown Voltage 4000AVC 50/60Hz; defibrillator proof
- Sweep speed: 12.5mm/s, 25mm/s, 50mm/s

### HR

- Range: Adult 10~300bpm  
Pediatric & Neonate: 10~350bpm
- Refreshing time:  $\approx$  50 bpm Per 2 pulses  
50~120bpm per 4 pulses  
 $\approx$  120bpm per 6 pulses
- Resolution: 1bpm
- Accuracy:  $\pm$ 1% or  $\pm$ 1bpm, whichever is greater

### ST segment

- Measurement range: -2.0mV~2.0mV
- Resolution: 0.01mV

### RESP

- Method: Impedance variation between RA-LL(R-F)
- Gain:  $\times 1$ ,  $\times 2$ ,  $\times 4$
- Bandwidth: 0.25Hz to 2.0Hz (-3dB)
- Sweep Speed: 6.25mm/s, 12.5mm/s, 25mm/s
- Measurement Range: 0~150 rpm
- Accuracy:  $\pm$  2rpm

### NIBP

- Method: Automatic oscillometry
- Range of measurement:  
Adult: 10~270mmHg  
Child: 10~235mmHg  
Neonate: 10~135mmHg
- Accuracy: Static:  $\pm$ 2% or  $\pm$ 3mmHg, whichever is greater
- Unit: mmHg, kPa
- Intervals for AUTO measurement time: 1, 2, 3, 4, 5, 10, 15, 20, 30, 45, 60, 90 minutes; 2, 4, 8 hours
- Pulse rate range: 40~240bpm

### Standard SpO2 (Digital)

- Measurement Range: 0~100%
- Accuracy: At 70~100%,  $\pm$ 2%  
At 10~69%, unspecified

### PR

- Measurement Range: 25~250bpm
- Accuracy:  $\pm$ 1% or  $\pm$ 1bpm, whichever is greater

### Nellcor-SpO2

- Measurement Range: 0~100%
- Resolution: 1%
- Accuracy: At 70~100%,  $\pm$ 2% (Adult)  
At 70~100%,  $\pm$ 3% (Neonate)  
At 70~100%,  $\pm$ 2% (Low Perfusion)  
At 10~69% unspecified

### PR

- Measurement Range: 20~300bpm
- Resolution: 1bpm
- Accuracy: 20bpm to 250bpm:  $\pm$ 3bpm  
251bpm to 300bpm: unspecified

### Masimo-SpO2

- Measurement Range: 0% to 100%
- Resolution: 1%
- Accuracy: 70% to 100%,  $\pm$ 2% (adult/pediatric, non-motion conditions)  
70% to 100%,  $\pm$ 3% (neonate, non-motion conditions)  
70% to 100%,  $\pm$ 3% (motion conditions)  
0% to 69%, unspecified
- Average time: 2-4s, 4-6s, 8s, 10s, 12s, 14s, 16s

### PR

- Measurement Range: 25bpm to 240bpm
- Accuracy:  $\pm$ 3bpm (non-motion conditions)  
 $\pm$  5bpm (motion conditions)
- Resolution: 1bpm

### TEMP

- Measurement Range: 25.0 $^{\circ}$ C~50.0 $^{\circ}$ C
- Accuracy:  $\pm$ 0.1 $^{\circ}$ C (exclusive of probe)
- Unit: Celsius ( $^{\circ}$ C), Fahrenheit ( $^{\circ}$ F)
- Connecting cable: Compatible with YSI-400 serial

### IBP

- Channel: 2
- Measurement way: Directly invasive pressure measurement
- Sensitivity of transducer: 5uV/V/mmHg,  $\pm$ 2%
- Impedance of transducer: 300 to 3000 $\Omega$
- Measurement Range: -50~+300mmHg
- Resolution: 1mmHg
- Unit: mmHg, kpa, cmH2O
- Accuracy:  
Static:  $\pm$ 1mmHg or  $\pm$ 2%, whichever is greater (exclusive of transducer)  
 $\pm$ 4mmHg or  $\pm$ 4%, whichever is greater (inclusion of transducer)  
Dynamic:  $\pm$ 4mmHg or 4%, whichever is greater
- Transducer sites: Arterial Pressure (ART)  
Pulmonary Artery Pressure (PA)  
Left Atrium Pressure (LAP)  
Right Atrium Pressure (RAP)  
Central Venous Pressure (CVP)  
Intracranial Pressure (ICP)

### EtCO2 (Sidestream)

- Measure method: Infrared spectrum
- Measure Range: 0.0~13.1% (0~99.6mmHg)
- Resolution: 1mmHg
- Unit: %, mmHg, kpa
- Accuracy: 0% to 4.9%,  $\pm$ 0.3% ( $\pm$ 2.0mmHg)  
5.0% to 13.1%,  $\pm$ 10% of the reading
- Measurement range of awRR: 2~150rpm
- Calibration: Offset calibration: auto, manual, Gain calibration

### EtCO2 (Mainstream)

- Measure method: Infrared spectrum
- Warm up time: Capnogram displayed in less than 15 seconds. At an ambient Temperature of 25 $^{\circ}$ C, full specifications within 2 minutes.
- Measure Range: 0.0~19.7% (0~150mmHg)
- Resolution: 1mmHg
- Rise time (10l/min):  $\approx$  60ms
- Unit: %, mmHg, kpa
- CO2 Accuracy: 0-40mmHg,  $\pm$ 2mmHg  
41-70mmHg,  $\pm$ 5% of reading  
71-100mmHg,  $\pm$ 8% of reading  
101-150mmHg,  $\pm$ 10% of reading  
(At 760 mmHg, ambient temperature of 35 $^{\circ}$ C)
- awRR measurement range: 0~150rpm
- awRR measurement Accuracy:  $\pm$ 1rpm

### EtCO2 (Microstream)

- Measure method: Infrared spectrum
- Warm up time: Capnogram displayed in less than 20 seconds. At an ambient Temperature of 25 $^{\circ}$ C, full specifications within 2 minutes.
- Measure Range: 0.0-19.7% (0-150mmHg)
- Resolution: 1mmHg
- Unit: %, mmHg, kpa
- CO2 Accuracy: 0-40mmHg,  $\pm$ 2mmHg  
41-70mmHg,  $\pm$ 5% of reading  
71-100mmHg,  $\pm$ 8% of reading  
101-150mmHg,  $\pm$ 10% of reading  
(At 760 mmHg, ambient temperature of 25 $^{\circ}$ C)  
(When RR>80 rpm, all the rang is  $\pm$ 12% of reading)  
CO2 response time: <3S
- awRR measurement range: 2~150rpm
- awRR measurement Accuracy:  $\pm$ 1rpm
- Sample Flow Rate: 50ml/min  $\pm$ 10ml/min

### Multi Gas

- Measure method: Infrared spectrum
- Fi and ET values: CO2, N2O, O2, AG (HAL, ISO, NEF, SEV, DES)
- Resolution: 1%
- Unit: %
- Calibration: Room air calibration automatically when changing aie way Adapter (<5 sec)
- Warm-up time: <10S, full accuracy within 1min
- Measurement and alarm range of AG

Gas	Range	Accuracy
CO2	0-10%	$\pm$ (0.3% ABS+4%REL)
N2O	0-100%	$\pm$ (2% ABS+8%REL)
O2	10-100%	$\pm$ (2% ABS+2%REL)
HAL ISQ ENF	0-5%	$\pm$ (0.15% ABS+10%REL)
SEV	0-8%	$\pm$ (0.15% ABS+10%REL)
DES	0-18%	$\pm$ (0.15% ABS+10%REL)

- awRR measurement range: 0~150rpm
- awRR measurement Accuracy:  $\pm$ 1rpm
- Rise time (flowing speed 10l/min): CO2  $\approx$  90ms  
O2  $\approx$  300ms  
N2O  $\approx$  300ms  
Hal, Iso, Enf, Sev, Des  $\approx$  300ms
- Total system response time: <1seconds

### Environment

- Operating temperature: 0~40 $^{\circ}$ C
- Transportation and Storage temperature: -20 $^{\circ}$ C to +50 $^{\circ}$ C
- Relative humidity: Working  $\approx$  85%  
Transportation and storage  $\approx$  93%
- Atmospheric pressure: 860hPa to 1060hPa  
Transportation and storage 500-1060 hPa

### Standard configuration of S90:

ECG, HR, RESP, SpO2, NIBP, 1-TEMP, Acid Battery, PR

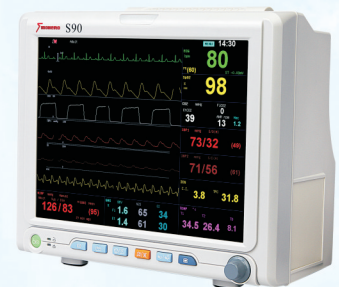
### Optional parameter & configuration of S90:

Nellcor SpO2, Masimo SpO2, 2-TEMP, 2-IBP, EtCO2 (Sidestream, Microstream, Mainstream)  
Multigas/O2, VGA output, Thermal recorder, Lithium Battery

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Specification subject to be changed without prior notice.



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